

AMENDMENTS TO THE CLAIMS:

Claim 1. (Currently amended) A cross joint comprising:

a cross shaft member comprising:

four shafts each comprising a neck portion and a race portion; and

shoulder portions between adjacent neck portions;

rolling members adapted to rotate on the race portions; and

bearing cups fitted to the respective shafts via the rolling members,

wherein each of the shoulder portions comprise a round-shaped section in a section including an axis center of the shaft,

wherein the round-shaped section has a center of curvature at an outer side of the cross shaft member,

wherein the round-shaped section does not include a concave corner,

wherein ~~the race portions and~~ the shoulder portions are subjected to roller burnishing for increasing a hardness of each surface of ~~the race portions and~~ the shoulder portions and for increasing a residual compressive stress immediately below each of said surfaces, and

wherein a residual compressive stress at a depth of at least 0.3 mm from each of surface of the shoulder portions subjected to roller burnishing is larger than a residual compressive stress at the deeper portions thereof.

Claim 2. (Previously presented) The cross joint according to claim 1, wherein a race portion formed on a bearing cup is subjected to roller burnishing.

Claim 3. (Previously presented) The cross joint according to claim 1, wherein a residual

compressive stress at a depth of approximately 0.3 mm from each of surfaces of ~~the race portions and~~ the shoulder portions subjected to the roller burnishing is equal to or larger than 800 MPa.

Claim 4. (Currently amended) The cross joint according to claim 1, wherein the cross shaft member comprises ~~and the bearing cups comprise~~ a carbon steel having a carbon content equal to or larger than 0.42 weight %.

Claims 5-10. (Canceled).

Claim 11. (Currently amended) The cross joint of claim 1, wherein at least one of said rolling roller members comprises a cylindrical roller.

Claim 12. (Currently amended) The cross joint of claim 1, wherein at least one of said rolling roller members comprises a needle roller.

Claim 13. (Currently amended) The cross joint of claim 1, wherein the roller burnishing of the shoulder increases a surface hardness of the shoulder and at least one of said shoulder portions comprises a hardness approximately equal to or larger than Hv700 from a surface to at least a depth of approximately 0.2 millimeters.

Claim 14. (Previously presented) The cross joint of claim 13, wherein at least one of said shoulder portions comprises a hardness approximately equal to or larger than Hv700 from a

surface to at least a depth of approximately 0.4 millimeters.

Claims 15-37. (Canceled).

Claim 38. (New) The cross joint of claim 1, wherein
the roller burnishing of the shoulder increases a surface hardness of the shoulder, and
said at least one roller-burnished shoulder comprises a hardness approximately equal
to or larger than Hv700 from a surface to at least a depth of approximately 0.2 millimeters.

Claim 39. (New) The cross joint of claim 38, wherein said at least one roller-burnished
shoulder comprises a hardness approximately equal to or larger than Hv700 from a surface to
a depth of at least 0.4 millimeters.

Claim 40. (New) The cross joint of claim 4, wherein the carbon steel comprises a carbon
content equal to or larger than 0.42 % by weight.

Claim 41. (New) The cross joint of claim 1, wherein the bearing cups comprise a carbon
steel.

Claim 42. (New) The cross joint of claim 41, wherein the carbon steel comprises a
carbon content equal to or larger than 0.42 % by weight.

Claim 43. (New) The cross joint of claim 1, wherein

the race portions are subjected to the roller burnishing for increasing a hardness of each surface of the race portions and for increasing a residual compressive stress immediately below each of said surfaces, and

a residual compressive stress at a depth of approximately 0.3 mm from each of the surfaces of the race portions subjected to the roller burnishing is larger than a residual compressive stress at a deeper portion thereof.

Claim 44. (New) The cross joint of claim 43, wherein the residual compressive stress at the depth of approximately 0.3 mm from each of the surfaces of the race portions subjected to the roller burnishing is equal to or larger than 800 MPa.

Claim 45. (New) The cross joint of claim 43, wherein the race portion does not include a portion with a convex corner to enlarge a diameter thereof.

Claim 46. (New) The cross joint of claim 43, wherein

the roller burnishing of the race portion increases a surface hardness of the race portion, and

at least one roller-burnished race portion comprises a hardness approximately equal to or larger than Hv700 from a surface to at least a depth of approximately 0.2 millimeters.

Claim 47. (New) The cross joint of claim 46, wherein the at least one roller-burnished race portion comprises a hardness of approximately equal to or larger than Hv700 from a surface to at least a depth of approximately 0.4 millimeters.

Claim 48. (New) The cross joint of claim 1, wherein

the race portions are subjected to the roller burnishing for increasing a hardness of each surface of the race portions and for increasing a residual compressive stress immediately below each of said surfaces, and

a residual compressive stress at a depth of approximately 0.3 mm from each of the surfaces of the race portions subjected to the roller burnishing is equal to or larger than 800 MPa.

Claim 49. (New) The cross joint of claim 48, wherein the race portion does not include a concave corner to enlarge a diameter thereof.

Claim 50. (New) A cross joint comprising:

a cross shaft member comprising:

four shafts each comprising a neck portion and a race portion; and

shoulder portions between adjacent neck portions;

rolling members adapted to rotate on the race portions; and

bearing cups fitted to the respective shafts via the rolling members,

wherein each of the shoulder portions comprises a round-shaped section in a section including an axis center of the shaft,

wherein the round-shaped section has a center of curvature at an outer side of the cross shaft member,

wherein the round-shaped section does not comprise a concave corner, and

wherein a residual compressive stress at a depth of at least 0.3 mm from each surface

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of the race portions and the shoulder portions subjected to the roller burnishing is equal to or larger than 800 MPa.